# SONY®

# *Interface Manual for Programmers*

Before operating the unit, please read this manual
thoroughly and retain it for future reference.

# DSR-20/20P

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**Chapter 2
Command Reference
(continued)**

# 1-1 Interface

## 1-1-1 RS-232C Interface

RS-232C is the EIA standard which defines the interface connection between a modem and a terminal device. Through this interface, the data is transferred in a serial format from one device to another.

The RS-232C interface is popular and available on most personal computers, resulting in a wide range of applications.

The connector for this interface is located on the rear panel of the DSR-20/20P.



**Personal computer** — RS-232C — DSR-20/20P
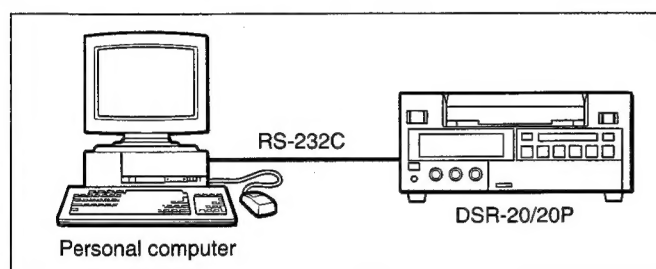
### Pin assignment
Several types of connectors are used for RS-232C interface connections. The illustration below shows a typical RS-232C connector that uses a 9-pin D-sub connector.

The table right shows the pin assignment necessary to receive and send data. Note that this assignment is the same on any other equipment. To send and receive data between two units, Pins 2 and 3 must be reversed in the cable.

### Connection cable
**Be sure to use a cross (TERMINAL) cable to connect the personal computer to the DSR-20/20P.**

**D-SUB 9-PIN CONNECTOR (Viewed form the out side)**
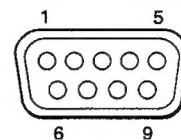


| Pin No. | Abbreviation | Function | Signal Flow |
|---------|--------------|----------|-------------|
| 1 | OPEN | Not Used | |
| 2 | RXD | Receive Data | Input |
| 3 | TXD | Transmit Data | Output |
| 4 | DTR | Data Transmission Ready | Output |
| 5 | SG | Signal Ground | |
| 6 | DSR | Data Set Ready | Input |
| 7 | RTS | Request To Send | Output |
| 8 | CTS | Clear To Send | Input |
| 9 | OPEN | Not Used | |

**External CPU**      **DSR-20 RS-232C Connector**

RXD 2 ← → 2 RXD
TXD 3 — → 3 TXD

SG 5 ——————— 5 SG
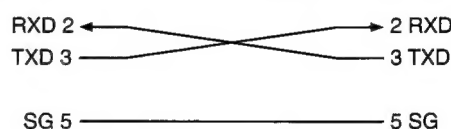
All signals conform to RS-232C specifications as follows:
Output level    when space 0: +5 V or more
           when mark 1: −5 V or less

## 1-1-2 Data Format

The list below shows the factory-set data format. You can only change the baud rate.

**Mode:** Asynchronous
**Character length:** 8 bits
**Baud rate:** 19200/9600 bps
     For the setting of the baud rate, see "Changing Settings" in the Operating Instructions.
**Parity check:** None
**Stop bit:** 1 bit

**Bit composition:** See the illustration below.

| START BIT | BIT 0 | BIT 1 | BIT 2 | BIT 3 | BIT 4 | BIT 5 | BIT 6 | BIT 7 | STOP BIT |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|----------|

**Note**

The RS-232C interface of this unit does not support hardware flow control.
Do not use control by RTS and DTR.

Communications are carried out one byte at a time. The computer sends one byte, waits for the response from the VCR, and is then free to send another one-byte command. The response from the VCR need not be a single byte, but may be, for example, a nine-byte time code value. Additionally, for commands such as EJECT, for which the corresponding operation takes an appreciable time, the VCR needs to return a response immediately to acknowledge the command, and a second response to indicate the result when the operation completes.

Command, response from the VCR and parameter are all defined as commands in the RS-232C communications protocol.

For details see the "Command Reference" later in this manual.

The reception modes refer to the following three VCR states:

**Local mode:** The REMOTE/LOCAL switch on the VCR is set to LOCAL.

**Normal mode:** The VCR is in the remote operating mode, and is ready to accept a command.

**Numeric input mode:** The VCR is in the remote operating mode, and is accepting a numerical parameter following a command.

This is illustrated by the following examples.

## Operating the VCR

### Command with no parameter
The VCR returns a single response byte.

Computer — Command —⟨3AH⟩—

VCR — Response —⟨0AH⟩—
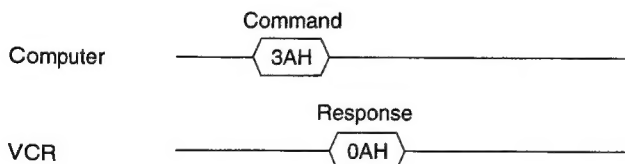
### Command with parameters

Computer — Extended command ⟨DFH⟩— Secondary command ⟨C5H⟩— Parameter 1 ⟨10H⟩------ Parameter n ⟨40H⟩—

VCR —⟨0AH⟩ Response —⟨0AH⟩ Response —⟨0AH⟩ Response ----⟨0AH⟩- Response
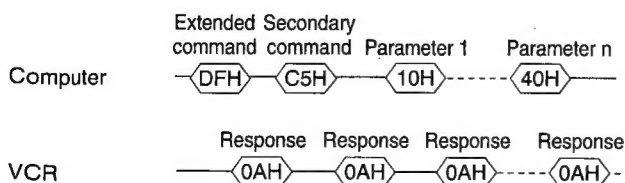
There are three different responses from the VCR: ACK, NAK, and ERROR.

**ACK:** positive acknowledgment. The VCR has accepted the command and is able to execute it.

**NAK:** negative acknowledgment. The VCR is unable to accept a command, because it is not defined, or because a parameter value is invalid, or received command is not executable.

**ERROR:** The VCR is unable to accept commands because of an error, such as tape slack.

## Getting the VCR status

The VCR returns a number of response bytes.

Computer — Command —⟨D7H⟩—

VCR — Response 1 ⟨80H⟩----- Response n ⟨00H⟩—
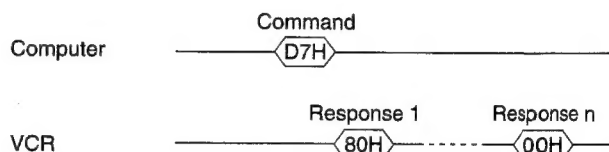
## Getting a completion response from the VCR

Computer — Command —⟨2AH⟩—

VCR — Response ⟨0AH⟩----- Response ⟨03H⟩—
↑ Completion
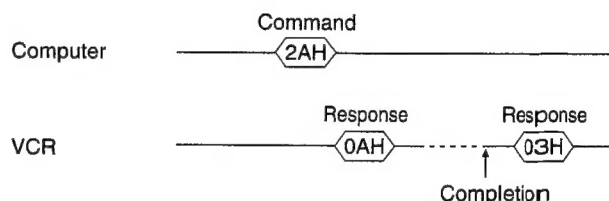
There are three different responses from the VCR: COMPLETION, NOT TARGET, and CASSETTE OUT.

**COMPLETION:** returned when the operation has completed normally on the VCR.

**NOT TARGET:** returned when the VCR was unable to locate the target point specified in the command.

**CASSETTE OUT:** returned when the VCR has ejected a cassette.

## Extended two-byte commands

Basically the protocol operates with single-byte commands, but in some cases a combination of two command bytes forms a single command.

```
                    Extended  Secondary
                    command   command
Computer   ────────⟨DFH⟩────⟨CCH⟩──────────────

                    Response  Response
VCR        ────────⟨0AH⟩────⟨0AH⟩──────────────
```
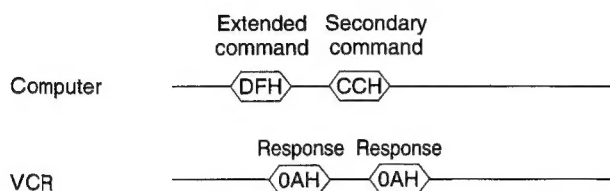
**Notes**

• Do not send the next command until the response from the VCR has been received. If, however, 10 milliseconds or more elapses without the VCR sending a response byte, this identifies a VCR operating abnormality, and it may be necessary to carry out the appropriate processing.
• Do not send another command in between an extended command and the corresponding secondary command. (In this case the VCR returns NAK.)

### Handling of time code and counter select values

Regardless of the setting of the time counter select switch on the front panel, time data on the RS-232C interface is always treated as timecode.

# 1-3    Command List

## 1-3-1   Command Table

| | 0 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9-7 |
|---|---|---|---|---|---|---|---|---|---|
| **0** | | | 0 | ENTER | INDEX ON | | | | IN-ENTRY |
| **1** | COMPLE-TION | | 1 | C.E. | INDEX OFF | | | | IN-ENTRY RESET |
| **2** | ERROR | | 2 | | | | ROM VERSION INQ | | OUT-ENTRY |
| **3** | CASSETTE OUT | | 3 | | | | | | OUT-ENTRY RESET |
| **4** | | | 4 | | | | | | IN-DATA + |
| **5** | NOT TARGET | | 5 | | | | | | IN-DATA − |
| **6** | | | 6 | | C.L. | | | | OUT-DATA + |
| **7** | | | 7 | | | STATUS INQ | | | OUT-DATA − |
| **8** | | | 8 | | | | | | IN-DATA PRESET |
| **9** | | | 9 | | | | | | OUT-DATA PRESET |
| **A** | ACK | EJECT | PLAY (+×1) | REVERSE PLAY (−×1) | | | | | IN-DATA SENSE |
| **B** | NAK | FORWARD STEP AND STILL | FORWARD FAST (+×2) | REVERSE FAST (−×2) | | | | | OUT-DATA SENSE |
| **C** | | REVERSE STEP AND STILL | FORWARD SLOW (+×1/5) | REVERSE SLOW (−×1/5) | | | | | |
| **D** | | | FORWARD STEP (+×1/30) | REVERSE STEP (−×1/30) | | | | | |
| **E** | | | F-SCAN (+×14 or +×17)* | R-SCAN (−×14 or −×17)* | | | | | |
| **F** | | | STOP | STILL | | | | DEVICE TYPE REQUEST | |

*+×14 and −×14 for the DSR-20, +×17 and −×17 for the DSR-20P

| | 9-8 | A | B | C | C-7 | C-8 | D | E | F |
|---|---|---|---|---|---|---|---|---|---|
| 0 | SEARCH AND PREROLL | TIME CODE SENSE | STATUS SENSE 2 | | | | | | |
| 1 | | | STATUS SENSE 3 | | TIMER MODE SENSE | | | | |
| 2 | | | | | | | | | |
| 3 | SEARCH WITH DATA | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | FORWARD SHUTTLE | | | | | | |
| 6 | EDIT PB STANDBY | | REVERSE SHUTTLE | | | | | | |
| 7 | | | | | | | STATUS SENSE 1 | | |
| 8 | EDIT PLAY | | | | | | | | |
| 9 | | | | | | | | | |
| A | | | | REC | VIDEO INPUT SELECT | | | | REC/DUB REQUEST |
| B | | F. FWD | | REC PAUSE | | | | | VCR INQ |
| C | EDIT OFF | REW | | | | | | | |
| D | | FORWARD FRAME STEP | | | | | | | |
| E | | REVERSE FRAME STEP | | | POWER ON | | EXP-7 | | |
| F | | | | | POWER OFF | C.L. AND INITIALIZE | EXP-8 | | |

## 1-3-2 Command List

### Handshake return codes

These codes are returned from the VCR.

| Command | Code |
|---|---|
| ACK | 0AH |
| NAK | 0BH |
| COMPLETION | 01H |
| ERROR | 02H |
| NOT TARGET | 05H |
| CASSETTE OUT | 03H |

In the following tables, commands are valid only when the VCR is in the reception mode marked with "√".

| Command | Code | Local mode | Normal mode | Numeric input mode |
|---|---|---|---|---|
| **Numeric commands** | | | | |
| Numeric values 0 to 9 | 30H - 39H | | | √ |
| ENTER | 40H | | | √ |
| **General-purpose function control commands** | | | | |
| C.E. | 41H | | √ | √ |
| C.L. | 56H | | √ | √ |
| C.L. AND INITIALIZE | EXP8 + CFH | | √ | |
| EXP-7 | DEH | √ | √ | |
| EXP-8 | DFH | √ | √ | |
| **Status inquiry commands** | | | | |
| DEVICE TYPE REQUEST | 8FH | √ | √ | √ |
| STATUS SENSE 1 | D7H | √ | √ | √ |
| STATUS SENSE 2 | B0H | √ | √ | √ |
| STATUS SENSE 3 | B1H | √ | √ | √ |
| STATUS INQ | 67H | √ | √ | √ |
| VCR INQ | FBH | √ | √ | √ |
| ROM VERSION INQ | 72H | √ | √ | √ |
| **Tape transport/operation mode control commands** | | | | |
| PLAY | 3AH | | √ | |
| REVERSE PLAY | 4AH | | √ | |
| FORWARD FAST | 3BH | | √ | |
| REVERSE FAST | 4BH | | √ | |
| FORWARD SLOW | 3CH | | √ | |
| REVERSE SLOW | 4CH | | √ | |
| FORWARD STEP | 3DH | | √ | |
| REVERSE STEP | 4DH | | √ | |
| FORWARD SCAN | 3EH | | √ | |
| REVERSE SCAN | 4EH | | √ | |
| FORWARD STEP AND STILL | 2BH | | √ | |
| REVERSE STEP AND STILL | 2CH | | √ | |

| Command | Code | Local mode | Normal mode | Numeric input mode |
|---|---|---|---|---|
| FORWARD FRAME STEP | ADH | | √ | |
| REVERSE FRAME STEP | AEH | | √ | |
| STILL | 4FH | | √ | |
| F. FWD | ABH | | √ | |
| REW | ACH | | √ | |
| FORWARD SHUTTLE | B5H | | √ | |
| REVERSE SHUTTLE | B6H | | √ | |
| STOP | 3FH | | √ | |
| EJECT | 2AH | | √ | |
| REC | CAH | | √ | |
| REC PAUSE | CBH | | √ | |
| REC/DUB REQUEST | FAH | | √ | |
| SEARCH WITH DATA | EXP8 + 93H | | √ | |
| INDEX ON | 50H | | √ | |
| INDEX OFF | 51H | | √ | |
| POWER ON | EXP7 + CEH | | √ | |
| POWER OFF | EXP7 + CFH | | √ | |
| VIDEO INPUTO SELECT | EXP7 + CAH | | √ | |
| **Edit operation commands** | | | | |
| IN-ENTRY | EXP7 + 90H | | √ | |
| IN-ENTRY RESET | EXP7 + 91H | | √ | |
| IN-DATA PRESET | EXP7 + 98H | | √ | |
| IN-DATA + | EXP7 + 94H | | √ | |
| IN-DATA – | EXP7 + 95H | | √ | |
| OUT-ENTRY | EXP7 + 92H | | √ | |
| OUT-ENTRY RESET | EXP7 + 93H | | √ | |
| OUT-DATA PRESET | EXP7 + 99H | | √ | |
| OUT-DATA + | EXP7 + 96H | | √ | |
| OUT-DATA – | EXP7 + 97H | | √ | |
| IN-DATA SENSE | EXP7 + 9AH | | √ | |
| OUT-DATA SENSE | EXP7 + 9BH | | √ | |
| EDIT OFF | EXP8 + 9CH | | √ | |
| SEARCH AND PREROLL | EXP8 + 90H | | √ | |
| EDIT PB STANDBY | EXP8 + 96H | | √ | |
| EDIT PLAY | EXP8 + 98H | | √ | |
| **Time data manipulation commands** | | | | |
| TIME CODE SENSE | A0H | √ | √ | √ |
| TIMER MODE SENSE | EXP7 + C1H | √ | √ | |

**Notes**

• The VCR mode changes automatically in the
following cases.
   **When STILL has continued for 5 minutes or
   longer:** The tape is advanced one frame every 5
   minutes.
   **When REC PAUSE has continued for 5 minutes
   or longer:** The VCR mode becomes STOP.
   **When the AUTO OFF menu item is selected and
   STOP mode has continued for 1 hour or longer
   with no operations performed:** The VCR is
   powered off.
   **When the AUTO REW menu item is selected and
   tape end is reached during recording or
   playback:** The tape is rewound to the start.
   **When ± × 1/10 or ± × 1/5 slow motion has
   continued for 1 minute or longer:** The VCR
   mode changes to PLAY.

• The correct status is not returned for the following
queries when the REMOTE/LOCAL switch on the
front panel of the VCR is set to LOCAL and when
the VCR is not powered on.
TIME CODE SENSE (A0H)
STATUS INQ (67H)
STATUS SENSE 1 (D7H)
STATUS SENSE 2 (B0H)
STATUS SENSE 3 (B1H)
TIMER MODE SENSE (C1H, EXP-7)

However, the correct status is returned in bit 7
(TIMER PLAY ON) and bit 6 (TIMER REC ON) of
byte 3 of Status 1, in bit 6 (POWER ON) and bit 3
(LOCAL) of byte 1 of Status 2, and in bit 6 (NTSC/
PAL) of byte 1 of Status 3.

For timecode, the value read immediately before
switching to local mode is returned.

• NAK may be returned for some commands when the
mechanical deck is changing modes, when the power
is being turned on and off, during search and preroll,
and during tape loading. Send the command again
after checking that the operation has finished.

# 2-1 General VCR Control Commands

## 2-1-1 Handshake Return Codes

**Note**
Commands described in this section are all return codes from the VCR and not executable commands.

### ACK (0AH)

**Function:** Acknowledges the specified command.

**Description:** When the connected VCR receives a valid command, the VCR accepts the command and returns the ACK code to the computer.

### NAK (0BH)

**Function:** Rejects the specified command.

**Description:** If the connected VCR receives an invalid command, the VCR rejects the command and returns the NAK code to the computer.

### COMPLETION (01H)

**Function:** Confirms successful completion of an operation.

**Description:** The VCR returns the COMPLETION code to the computer when the operations given below are successfully completed.

| | | |
|---|---|---|
| EXP-8, | 90H | SEARCH AND PREROLL |
| EXP-8, | 93H | SEARCH WITH DATA |
| EXP-8, | 96H | EDIT PB STANDBY |
| EXP-8, | 98H | EDIT PLAY |

### ERROR (02H)

**Function:** Notifies of an error in operation.

**Description:** The VCR returns the ERROR code to the computer when:
• The VCR enters emergency mode.
• A command cannot be executed.

For example, ERROR is returned when the phase synchronization has not been completed before the IN point after executing EDIT REC command while in edit mode.

### NOT TARGET (05H)

**Function:** Notifies that the target time code could not be found on the tape being played.

### CASSETTE OUT (03H)

**Function:** Notifies that the cassette is ejected from the VCR by the EJECT command.

**Description:** The VCR returns the CASSETTE OUT code to the computer after the EJECT command execution is completed.

## 2-1-2 Numeric Input Commands

Use these commands when specifying the parameters required after the commands shown in the following table.

| | | |
|---|---|---|
| EXP-8, | 93H | SEARCH WITH DATA |
| EXP-7, | 98H | IN-DATA PRESET |
| EXP-7, | 99H | OUT-DATA PRESET |
| | B5H | FORWARD SHUTTLE |
| | B6H | REVERSE SHUTTLE |

### 0 - 9 (30H - 39H)

**Function:** Indicates a hexadecimal digit 0 to 9.

**Note**
Numeric input mode is canceled if the REMOTE/LOCAL switch on the front panel of the VCR is switched to LOCAL during input of numeric data (30H to 39H). Reenter the numeric data from the start after switching back to REMOTE mode.

### ENTER (40H)

**Function:** Indicates the end of data input by means of a numeric command.
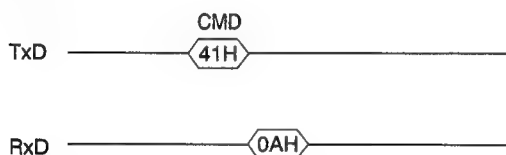
### 2-1-3 General-Purpose Function Control Commands

#### C.E. (41H)

**Function:** Clears an error state or the input of the last numerical data value.

**Description:** When this command is received, the VCR sequence continues, but the VCR becomes able to receive a command.
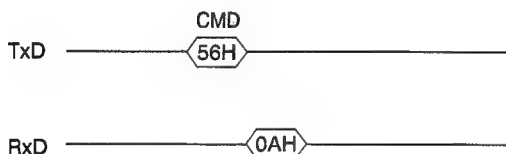
**Sample:**

```
                    CMD
TxD ───────────⟨41H⟩──────────────

RxD ───────────────────⟨0AH⟩───────────
```

#### C.L. (56H)

**Function:** Clears any ERROR condition.

**Description:** When this command is received, the VCR becomes able to receive a command. This command takes precedence over other commands.

**Sample:**

```
                    CMD
TxD ───────────⟨56H⟩──────────────

RxD ───────────────────⟨0AH⟩───────────
```

**Note**

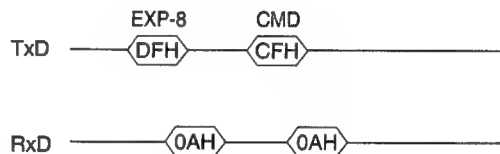This command ends the specified VCR sequence, and puts the VCR into still mode.

#### C.L. AND INITIALIZE (CFH, EXP-8)

**Function:** Clears all ERROR states, and initializes the VCR.

**Description:** This command has the same effect as the C.L. command. It also makes the following VCR settings. When this command is received, the VCR becomes able to receive a command. This command takes precedence over other commands.
IN-ENTRY RESET
OUT-ENTRY RESET

**Sample:**

```
            EXP-8      CMD
TxD ───⟨DFH⟩───⟨CFH⟩──────────

RxD ────────⟨0AH⟩───⟨0AH⟩─────────
```

**Note**

This command ends the specified sequence and puts the VCR into still mode.

#### EXP-7 (DEH), EXP-8 (DFH)

**Function:** EXP-7, EXP-8 commands are the seventh and eighth extension commands. These commands will become effective only after the commands defined after these commands are sent.

## 2-1-4 Status Inquiry Commands

### DEVICE TYPE REQUEST (8FH)

**Function:** Asks for the type of the device to be controlled by the computer.

**Description:** When the controlled device receives this command, it returns the 1 byte code shown below.

| Bit 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | × | × | LDP |
| 1 | 0 | 0 | 0 | 0 | 1 | × | × | U-matic |
| 1 | 0 | 0 | 0 | 1 | 0 | × | × | VHS |
| 1 | 0 | 0 | 0 | 1 | 1 | × | × | 8 mm/DVCAM |
| 1 | 0 | 0 | 1 | 0 | 0 | × | × | CRV Disk |
| 1 | 0 | 0 | 1 | 0 | 1 | × | × | HDL |
| 1 | 0 | 0 | 1 | 1 | 0 | × | × | Betacam |

DSR-20/20P returns the following:

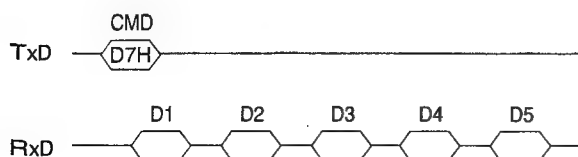| VCR | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|
| DSR-20/20P | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |

**Note**

The NTSC/PAL flag shows which VCR you are using, the DSR-20 or DSR-20P. For the NTSC/PAL flag, see "2-7-1 Status 3 Data Table".

### STATUS SENSE 1 (D7H)

**Function:** Commands the VCR to return the VCR status using 5-byte data regardless of the REMOTE/LOCAL selector setting.

**Sample:**



**Note**

For the status data you can obtain from the VCR, see "2-5-1 Status 1 Data Table".

### STATUS SENSE 2 (B0H)

**Function:** Commands the VCR to return the VCR status using 5-byte data regardless of the REMOTE/LOCAL selector setting.
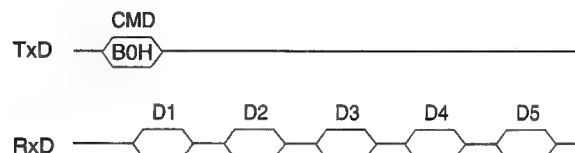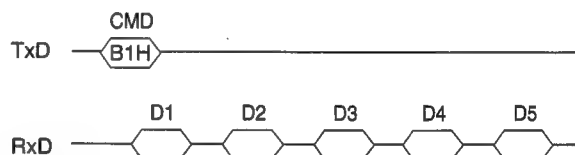
**Sample:**



**Note**

For the status data you can obtain from the VCR, see "2-6-1 Status 2 Data Table".

### STATUS SENSE 3 (B1H)

**Function:** Commands the VCR to return the VCR status using 5-byte data regardless of the REMOTE/LOCAL selector setting.
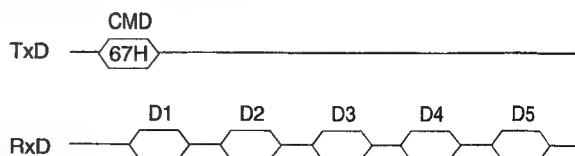
**Sample:**



**Note**

For the status data you can obtain from the VCR, see "2-7-1 Status 3 Data Table".

### STATUS INQ (67H)

**Function:** Requests current operating status from VCR.



**Note**

For the status data you can obtain from the VCR, see "2-8-1 Status INQ Data Table".

### VCR INQ (FBH)

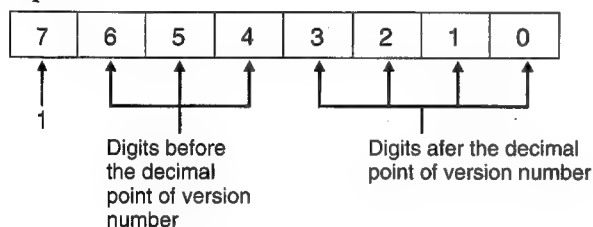**Function:** Confirms whether the connected device is a VCR or not.

**Description:** When the VCR receives this command it returns an ACK.
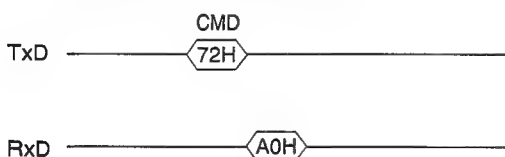
### ROM VERSION INQ (72H)

**Function:** Requests the controlled device for its ROM version.

**Description:** When this command is sent, the VCR returns a 1-byte data representing its built-in ROM version number. The contents of the data are shown below.

**Sample:**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|

1

Digits before the decimal point of version number

Digits afer the decimal point of version number

In the case of Version No. 2.0

```
        CMD
TxD ──────⟨72H⟩──────────────

RxD ─────────────⟨A0H⟩────────────
```

**Note**

The correct status is not returned for the following queries when the switch on the front panel of the VCR is set to LOCAL and when the VCR is not powered on.
TIME CODE SENSE (A0H)
STATUS INQ (67H)
STATUS SENSE 1 (D7H)
STATUS SENSE 2 (B0H)
STATUS SENSE 3 (B1H)
TIMER MODE SENSE (C1H, EXP-7)

However, the correct status is returned in bit 7 (TIMER PLAY ON) and bit 6 (TIMER REC ON) of byte 3 of Status 1, in bit 6 (POWER ON) and bit 3 (LOCAL) of byte 1 of Status 2, and in bit 6 (NTSC/PAL) of byte 1 of Status 3.

For timecode, the value read immediately before switching to local mode is returned.
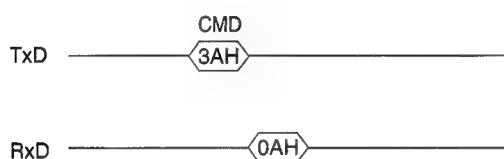
## 2-2-1 Control Commands for the VCR's Basic Functions

### PLAY (3AH)

**Function:** Puts the VCR in normal-speed PLAY mode.

**Description:** When the PLAY command is sent, the VCR carries out playback in the forward direction at normal speed.

**Sample:**

```
            CMD
TxD ————————<3AH>————————————————

RxD ———————————————<0AH>—————————
```

### REVERSE PLAY (4AH)

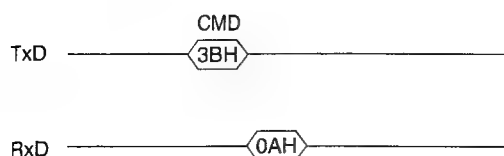**Function:** Puts the VCR in normal-speed reverse PLAY mode.

**Description:** When the REVERSE PLAY command is sent, the VCR carries out playback in the reverse direction at normal speed.

### FORWARD FAST (3BH)

**Function:** Puts the VCR in fast forward playback mode (two times the normal speed).

**Description:** When the FORWARD FAST command is sent, the VCR carries out playback at five times the normal speed in the forward direction.

**Sample:**

```
            CMD
TxD ————————<3BH>————————————————

RxD ———————————<0AH>—————————————
```

### REVERSE FAST (4BH)

**Function:** Puts the VCR in fast reverse playback mode (two times the normal speed).
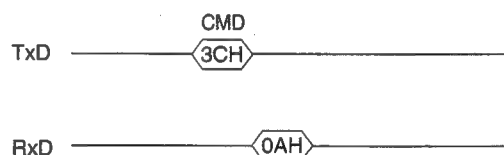
**Description:** When the REVERSE FAST command is sent, the VCR carries out playback at five times the normal speed in the reverse direction.

### FORWARD SLOW (3CH)

**Function:** Puts the VCR in slow-motion forward playback mode.

**Description:** When the FORWARD SLOW command is sent, the VCR carries out playback in the forward direction at 1/5 of normal speed.

**Sample:**

```
            CMD
TxD ————————<3CH>————————————————

RxD ———————————————<0AH>—————————
```

### REVERSE SLOW (4CH)

**Function:** Puts the VCR in slow-motion reverse playback mode.

**Description:** When the REVERSE SLOW command is sent, the VCR carries out playback in the reverse direction at 1/5 of normal speed.
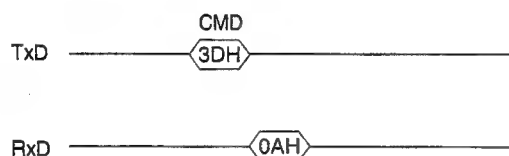
### FORWARD STEP (3DH)

**Function:** Puts the VCR in slow-motion forward playback mode.

**Description:** When the FORWARD STEP command is sent, the VCR carries out playback in the forward direction at 1/30 of normal speed.

**Sample:**

```
            CMD
TxD  ——————⟨3DH⟩——————————————


RxD  ————————————⟨0AH⟩——————————
```
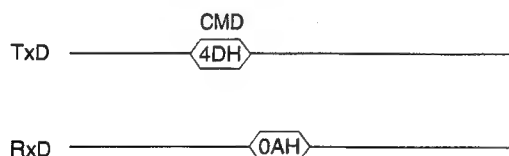
**Note**

This unit does not support option commands. The VCR will return the NAK code if you send a speed parameter after this command.

### REVERSE STEP (4DH)

**Function:** Puts the VCR in slow-motion reverse playback mode.

**Description:** Puts the REVERSE STEP command is sent, the VCR carries out playback in the reverse direction at 1/30 of normal speed.

**Sample:**

```
            CMD
TxD  ——————⟨4DH⟩——————————————


RxD  ————————————⟨0AH⟩——————————
```

**Note**

This unit does not support option commands. The VCR will return the NAK code if you send a speed parameter after this command.

### FORWARD SCAN (3EH)

**Function:** Puts the VCR in forward scan playback mode.

**Description:** When the FORWARD SCAN command is sent, the VCR scans the tape in forward direction at 14 times (DSR-20) or 17 times (DSR-20P) the normal speed.

**Sample:**

```
               CMD
TxD  ——————————⟨3EH⟩——————————


RxD  ——————————————⟨0AH⟩————————
```
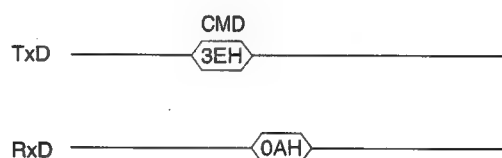
### REVERSE SCAN (4EH)

**Function:** Puts the VCR in reverse scan playback mode.
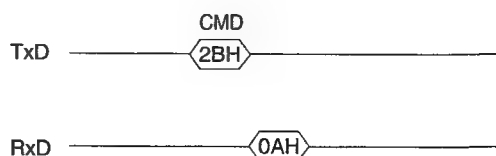
**Description:** When the REVERSE SCAN command is sent, the VCR scans the tape in the reverse direction at 14 times (DSR-20) or 17 times (DSR-20P) the normal speed.

### FORWARD STEP AND STILL (2BH)

**Function:** Advances the video cassette tape by one frame and freezes the picture.

**Description:** When the FORWARD STEP AND STILL command is sent, the VCR advances the still picture by one frame and resumes still playback. If the VCR is not in still mode when this command is received, it will be put in the still mode.

**Sample:**

```
               CMD
TxD  ——————————⟨2BH⟩——————————


RxD  ——————————————⟨0AH⟩————————
```

## REVERSE STEP AND STILL (2CH)

**Function:** Reverses the video cassette tape by one frame and freezes the picture.
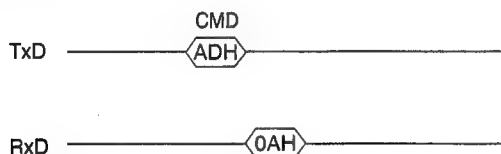
**Description:** When the REVERSE STEP AND STILL command is sent, the VCR reverses the still picture by one frame and resumes still playback. If the VCR is not in still mode when this command is received, it will be put in the still mode.

## FORWARD FRAME STEP (ADH)

**Function:** Advances the video cassette tape by one frame and freezes the picture.

**Description:** When the FORWARD FRAME STEP command is sent, the VCR advances the still picture by one frame and resumes still playback. If the VCR is not in still mode when this command is received, the frame following the one that was played at the time the command was received is played back in still mode.

**Sample:**

```
                CMD
TxD ──────────⟨ADH⟩──────────────

RxD ─────────────────⟨0AH⟩────────
```

## REVERSE FRAME STEP (AEH)

**Function:** Reverse the video cassette tape by one frame and freezes the picture.

**Description:** When the REVERSE FRAME STEP command is sent, the VCR reverses the still picture by one frame and resumes still playback. If the VCR is not in still mode when this command is received, the frame prior to the one that was played at the time the command was received is played back in still mode.

## STILL (4FH)

**Function:** Puts the VCR in still (STILL) mode.

**Sample:**

```
                CMD
TxD ──────────⟨4FH⟩──────────────

RxD ─────────────────⟨0AH⟩────────
```
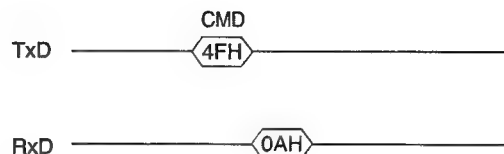
## F. FWD (ABH)

**Function:** Puts the VCR in fast forward (F. FWD) mode.

**Sample:**

```
                CMD
TxD ──────────⟨ABH⟩──────────────

RxD ─────────────────⟨0AH⟩────────
```
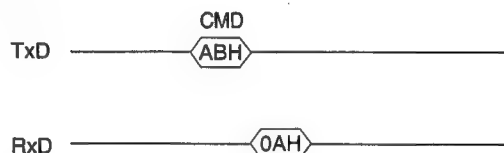
## REW (ACH)

**Function:** Puts the VCR in rewind ( REW) mode.

**Sample:**

```
                CMD
TxD ──────────⟨ACH⟩──────────────

RxD ─────────────────⟨0AH⟩────────
```
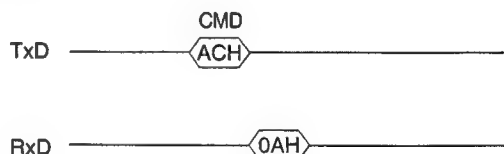
### FORWARD SHUTTLE (B5H)

**Function:** Puts the VCR in playback mode and the tape runs in the forward direction at a specified speed.

**Description:** A fast or slow-motion forward picture is reproduced. Enter the desired speed data (from the selections given below) directly after this command.

**Sample:**

```
              CMD   SPEED
                    DATA
TxD  ────────⟨B5H⟩──⟨31H⟩────────────

RxD  ──────────⟨0AH⟩────⟨0AH⟩──────────
```
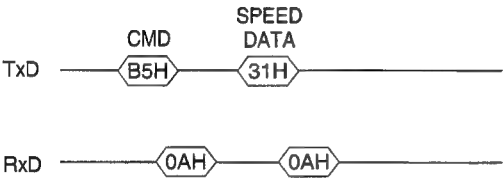
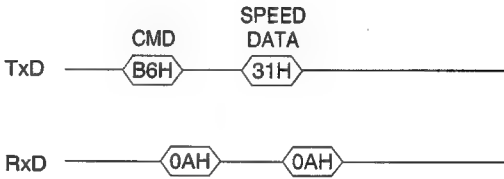| Item | | Speed | Data |
|------|---|-------|------|
| 1 | | STILL | 30H |
| 2 | | ×1/30 | 31H |
| 3 | | ×1/10 | 32H |
| 4 | | ×1/5 | 33H |
| 5 | | ×1/5 | 34H |
| 6 | | ×1 | 35H |
| 7 | | ×2 | 36H |
| 8 | DSR-20 | ×9 | 37H |
| | DSR-20P | ×11 | |
| 9 | DSR-20 | ×14 | 38H |
| | DSR-20P | ×17 | |

**Note**
The ENTER command input is not required.

### REVERSE SHUTTLE (B6H)

**Function:** Puts the VCR in playback mode and the tape runs in the reverse direction at a specified speed.

**Description:** A fast- or slow-motion reverse picture is reproduced. Enter the desired speed data (from the selections given below) directly after this command.

**Sample:**

```
              CMD   SPEED
                    DATA
TxD  ────────⟨B6H⟩──⟨31H⟩────────────

RxD  ──────────⟨0AH⟩────⟨0AH⟩──────────
```

| Item | | Speed | Data |
|------|---|-------|------|
| 1 | | STILL | 30H |
| 2 | | ×1/30 | 31H |
| 3 | | ×1/10 | 32H |
| 4 | | ×1/5 | 33H |
| 5 | | ×1/5 | 34H |
| 6 | | ×1 | 35H |
| 7 | | ×2 | 36H |
| 8 | DSR-20 | ×9 | 37H |
| | DSR-20P | ×11 | |
| 9 | DSR-20 | ×14 | 38H |
| | DSR-20P | ×17 | |

**Note**
The ENTER command input is not required.

### STOP (3FH)

**Function:** Puts the VCR in stop mode.

**Sample:**

```
                  CMD
TxD  ────────────⟨3FH⟩────────────

RxD  ──────────────⟨0AH⟩──────────
```
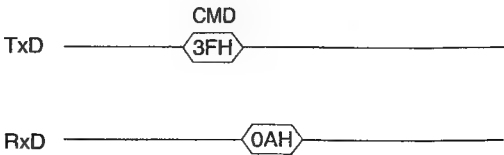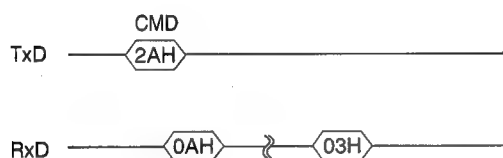
## EJECT (2AH)

**Function:** Ejects the cassette tape from the VCR.

**Description:** When the EJECT command is sent, the VCR stops operation and ejects the cassette tape. After the EJECT command execution is completed, the VCR returns the CASSETTE OUT code to the computer.
If this command is sent when a tape is not loaded, the VCR returns the NAK code.
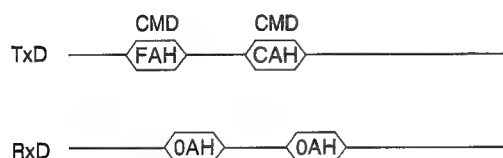
**Sample:**

```
           CMD
TxD  ──────⟨2AH⟩──────────────────────

RxD  ──────────⟨0AH⟩──⁓──⟨03H⟩──────────
```

## REC (CAH)

**Function:** Puts the VCR in recording (REC) mode. Send the REC/DUB REQUEST command before this command.

**Sample:**

```
           CMD        CMD
TxD  ──────⟨FAH⟩──────⟨CAH⟩──────────────

RxD  ──────────⟨0AH⟩──────⟨0AH⟩──────────
```
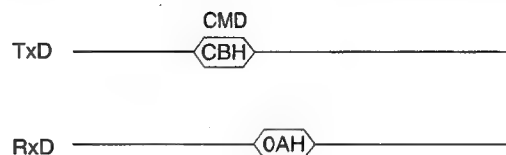
**Notes**

- When the REC command is sent without first sending the REC/DUB REQUEST command, the VCR returns the NAK code.
  Send the REC command after sending the REC/DUB REQUEST command. Do not insert any other commands between these two commands.
- During recording to tape, the only valid operation mode commands are STOP and REC PAUSE.

## REC PAUSE (CBH)

**Function:** Puts the VCR in recording standby (REC PAUSE) mode.

**Sample:**

```
                 CMD
TxD  ────────────⟨CBH⟩──────────────────

RxD  ───────────────────⟨0AH⟩────────────
```

## REC/DUB REQUEST (FAH)

**Function:** Puts the VCR in a ready state for the REC command. This command must be sent first to start recording.
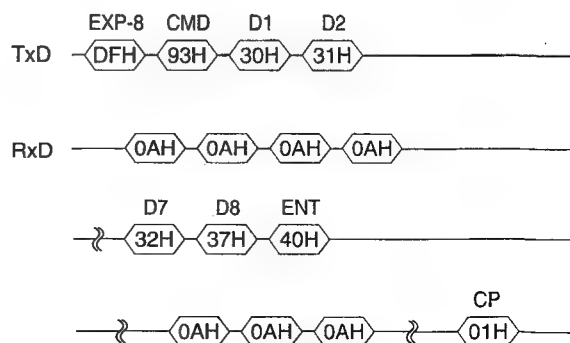
**Note**

Send the REC command after sending the REC/DUB REQUEST command. Do not insert any other commands between these two commands.

## 2-2-2 Specified Sequence Commands

### SEARCH WITH DATA (93H, EXP-8)

**Function:** Searches for the desired tape point using the time data. When searching is complete, the VCR returns the COMPLETION code.

**Sample:** To search for the 01H 34M 51S 27F point

```
      EXP-8  CMD    D1      D2
TxD  ⟨DFH⟩─⟨93H⟩─⟨30H⟩─⟨31H⟩─────────

RxD  ────⟨0AH⟩─⟨0AH⟩─⟨0AH⟩─⟨0AH⟩──────

          D7      D8     ENT
  ─⁓─⟨32H⟩─⟨37H⟩─⟨40H⟩──────────

                              CP
  ─⁓──⟨0AH⟩─⟨0AH⟩─⟨0AH⟩─⁓─⟨01H⟩────
```

30H through 39H are used for the numeric data.

### INDEX ON (50H)

**Function:** Displays the time data on the monitor connected to the MONITOR OUT connector.

**Sample:**

```
          CMD
TxD  ─────〈50H〉──────────────

RxD  ──────────〈0AH〉──────────
```
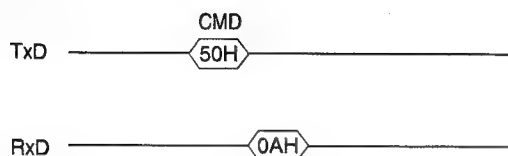
**Notes**

• When the INPUT SELECT or INDEX ON/OFF command is sent, bit 5 (MECHANICAL TRANSITION) of byte 5 of Status 2 may be on.
• The NAK code is returned if the INPUT SELECT or INDEX ON/OFF command is sent during execution of SEARCH WITH DATA or SEARCH AND PREROLL operations (the mode cannot be switched during the operation).
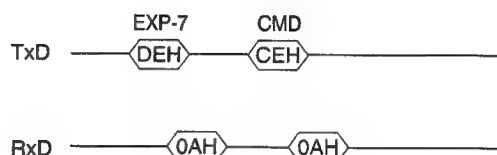
### INDEX OFF (51H)

**Function:** Disables displaying of the time data on the monitor.

### POWER ON (CEH, EXP-7)

**Function:** Turns the VCR power on.

**Description:** The VCR is powered on only when the REMOTE/LOCAL switch is set to REMOTE and the VCR is supplied with AC power.

**Sample:**

```
          EXP-7     CMD
TxD  ────〈DEH〉────〈CEH〉──────────

RxD  ───────〈0AH〉────〈0AH〉────────
```

**Note**

About 5 seconds are required for VCR initialization after power on.
Send the first command after initialization finishes.
After sending the POWER ON command, check that bit 6 (POWER ON flag) of byte 1 of Status 2 is set to 1 before sending the next command.

### POWER OFF (CFH, EXP-7)

**Function:** Puts the VCR power into standby mode.

**Description:** VCR power is set to standby mode only when the REMOTE/LOCAL switch is set to REMOTE.

**Sample:**

```
          EXP-7     CMD
TxD  ───〈DEH〉────〈CFH〉──────────

RxD  ──────〈0AH〉────〈0AH〉────────
```
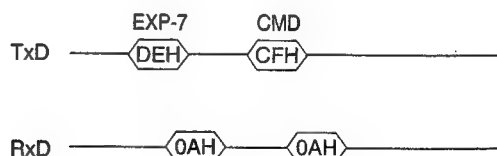
## VIDEO INPUT SELECT (CAH, EXP-7)

**Function:** Select the video input source.

**Description:** This command selects one of the following video input source modes.
The VIDEO INPUT SELECT command is valid only when the LOCAL/REMOTE switch of the VCR is set to REMOTE.

| D1 | Mode |
|-----|---------|
| 31H | S VIDEO |
| 32H | VIDEO |
| 33H | DV |

**• S VIDEO**
This is the mode for recording S-video signals input to the S VIDEO connector.
**• VIDEO**
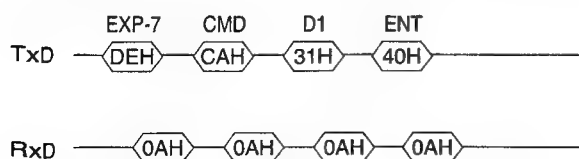This is the mode for recording video signals input to the VIDEO connector.
**• DV**
This is the mode for recording video signals input to the DV connector.

### Notes

• If this command is not sent after switching from LOCAL mode to REMOTE mode, the video input source mode is the mode selected in LOCAL mode.
• When the INPUT SELECT or INDEX ON/OFF commands are sent, bit 5 (MECHANICAL TRANSITION) of byte 5 of Status 2 may be on.
• The NAK code is returned if the INPUT SELECT or INDEX ON/OFF commands are sent during execution of SEARCH WITH DATA or SEARCH AND PREROLL operations (the mode cannot be switched during the operation).

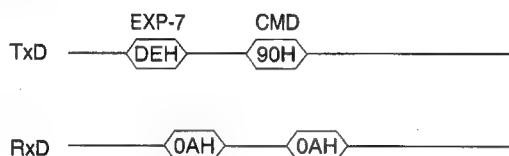**Sample:** To change the video input source mode to S VIDEO

```
         EXP-7    CMD     D1     ENT
TxD ───⟨DEH⟩───⟨CAH⟩───⟨31H⟩───⟨40H⟩─────────────


RxD ──────⟨0AH⟩───⟨0AH⟩───⟨0AH⟩───⟨0AH⟩─────────
```

# 2-3 Edit Operation Commands

## 2-3-1 Edit Point Set Commands

### IN-ENTRY (90H, EXP-7)

**Function:** Stores the time data read by the VCR in the IN-ENTRY memory of the VCR.

**Sample:**



**Notes**

- You cannot set more than one IN point in the IN-ENTRY memory.
- The VCR returns the NAK code if a tape is not loaded when this command is sent.
- In STOP mode, bit 1 (TIME CODE DETECT) of byte 1 of Status 2 is set to 1. Even if timecode is displayed in this unit's display window and on the monitor, the VCR returns the NAK code in response to IN-ENTRY and OUT-ENTRY commands. Check to be sure that the tape is running and that timecode is being read correctly before issuing these two commands.
- When the tape is running, the TIME CODE DETECT is set to 0 for unrecorded sections, and " − − : − − : − − : − −" is displayed in this unit's display window and on the monitor. The VCR returns the ACK code in response to IN-ENTRY and OUT-ENTRY commands. The most recently read timecode or "00:00:00:00" is registered.

### IN-ENTRY RESET (91H, EXP-7)

**Function:** Resets the time data stored in the IN-ENTRY memory of the VCR.
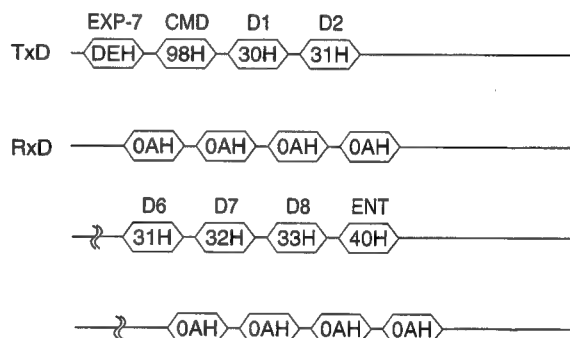
**Sample:**
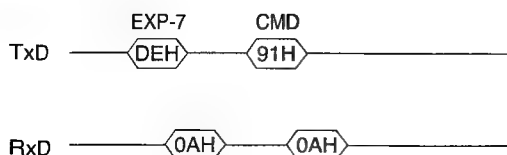


**Notes**

- When this command is executed, the IN-ENTRY flag of status 2 is reset.
- If the IN-DATA SENSE command is sent at this time, the VCR returns the last IN-POINT time data stored.
- If this command is sent while the edit command is executed, the VCR returns the NAK code.

### IN-DATA PRESET (98H, EXP-7)

**Function:** Presets the time data in the IN-ENTRY memory of the VCR.

**Sample:** To preset 01H 34M 51S 23F
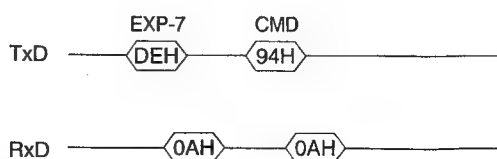


30H through 39H are used for numeric data.

**Note**

If this command is sent while the edit command is executed, the VCR returns the NAK code.

### IN-DATA + (94H, EXP-7)

**Function:** Increments the time data stored in the IN-ENTRY memory of the VCR by one frame.

**Sample:**



**Notes**

- If no time data is stored in the IN-ENTRY memory of the VCR, it returns the NAK code.
- If this command is sent while the edit command is executed, the VCR returns the NAK code.

## IN-DATA – (95H, EXP-7)

**Function:** Decrements the time data stored in the IN-ENTRY memory of the VCR by one frame.
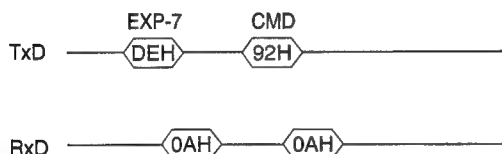
**Notes**

- If no time data is stored in the IN-ENTRY memory of the VCR, it returns the NAK code.
- If this command is sent while the edit command is executed, the VCR returns the NAK code.

## OUT-ENTRY (92H, EXP-7)

**Function:** Stores the time data read by the VCR in the OUT-ENTRY memory of the VCR.

**Sample:**

```
              EXP-7        CMD
TxD  ────────⟨DEH⟩────────⟨92H⟩──────────────

RxD  ─────────────────⟨0AH⟩────⟨0AH⟩──────────
```
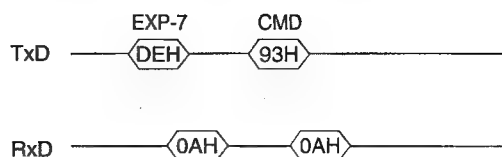
**Notes**

- You cannot set more than one OUT point in the OUT-ENTRY memory.
- The VCR returns the NAK code if a tape is not loaded when this command is sent.
- In STOP mode, bit 1 (TIME CODE DETECT) of byte 1 of Status 2 is set to 1. Even if timecode is displayed in this unit's display window and on the monitor, the VCR returns the NAK code in response to IN-ENTRY and OUT-ENTRY commands. Check to be sure that the tape is running and that timecode is being read correctly before issuing these two commands.
- When the tape is running, the TIME CODE DETECT is set to 0 for unrecorded sections, and " – – : – – : – – : – –" is displayed in this unit's display window and on the monitor. The VCR returns the ACK code in response to IN-ENTRY and OUT-ENTRY commands. The most recently read timecode or "00:00:00:00" is registered.

## OUT-ENTRY RESET (93H, EXP-7)

**Function:** Resets the time data stored in the OUT-ENTRY memory of the VCR.

**Sample:**

```
              EXP-7        CMD
TxD  ────────⟨DEH⟩────────⟨93H⟩──────────────

RxD  ─────────────────⟨0AH⟩────⟨0AH⟩──────────
```

**Notes**

- When this command is executed, the OUT-ENTRY flag of status 2 is reset.
- If the OUT-DATA SENSE command is sent at this time, the VCR returns the last OUT-POINT time data stored
- When the tape is running, the TIME CODE DETECT is set to 0 for unrecorded sections, and " – – : – – : – – : – –" is displayed in this unit's display window and on the monitor. The VCR returns the ACK code in response to IN-ENTRY and OUT-ENTRY commands. The most recently read timecode or "00:00:00:00" is registered.

## OUT-DATA PRESET (99H, EXP-7)

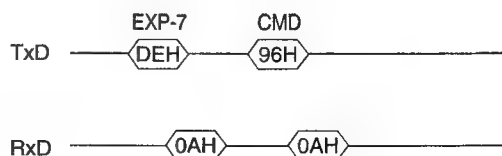**Function:** Presets the time data in the OUT-ENTRY memory of the VCR.

**Note**

If this command is sent while the edit command is executed, the VCR returns the NAK code.

## OUT-DATA + (96H, EXP-7)

**Function:** Increments the time data stored in the OUT-ENTRY memory of the VCR by one frame.

**Sample:**

```
              EXP-7        CMD
TxD  ────────⟨DEH⟩────────⟨96H⟩──────────────

RxD  ─────────────────⟨0AH⟩────⟨0AH⟩──────────
```

**Notes**

- If no time data is stored in the OUT-ENTRY memory of the VCR, it returns the NAK code.
- If this command is sent while the edit command is executed, the VCR returns the NAK code.

## 2-3 Edit Operation Commands

### OUT-DATA – (97H, EXP-7)

**Function:** Decrements the time data stored in the OUT-ENTRY memory of the VCR by one frame.
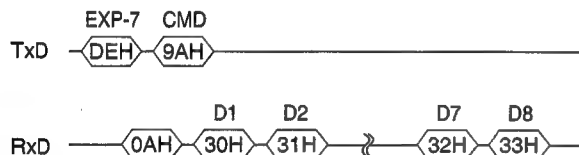
**Notes**

• If no time data is stored in the OUT-ENTRY memory of the VCR, it returns the NAK code.
• If this command is sent while the edit command is executed, the VCR returns the NAK code.

### 2-3-2 Edit Point Inquiry Commands

### IN-DATA SENSE (9AH, EXP-7)

**Function:** Commands the VCR to send the time data stored in the IN-ENTRY memory of the VCR back to the computer.

**Sample:** For the IN-POINT time code data 01H 34M 51S 23F



**Notes**

• If no time data is stored in the IN-ENTRY memory of the VCR, it returns "00H00M00S00F".
• When the IN-ENTRY flag is set, the time data for the most recently registered IN point is returned.

### OUT-DATA SENSE (9BH, EXP-7)

**Function:** Commands the VCR to send the time data stored in the OUT-ENTRY memory of the VCR back to the computer.
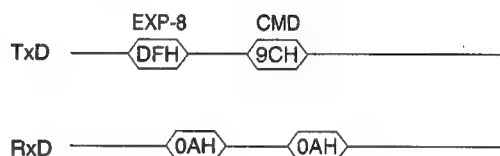
**Notes**

• If no time data is stored in the OUT-ENTRY memory of the VCR, it returns "00H00M00S00F".
• When the OUT-ENTRY flag is set, the time data for the most recently registered OUT point is returned.

### 2-3-3 Edit Tape Transport Control Commands

### EDIT OFF (9CH, EXP-8)

**Function:** Exits the SEARCH AND PREROLL, EDIT PB STANDBY and EDIT PLAY modes.
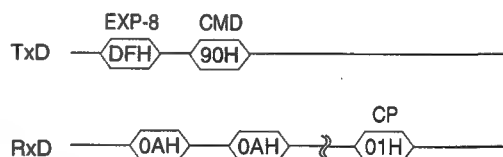
**Sample:**



### SEARCH AND PREROLL (90H, EXP-8)

**Function:** Prerolls the tape.

**Description:** The SEARCH AND PREROLL command prerolls the tape to a position 3 seconds +1 frame before the IN point.
When preroll finishes, the VCR returns the COMPLETION code to the computer.

**Sample:**



**Note**

If this command is sent without setting the data for the IN point, the time data for the time at which the command is received is registered as the IN point.
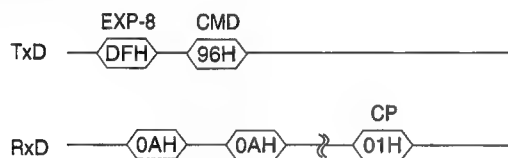
## EDIT PB STANDBY (96H, EXP-8)

**Function:** Used for editing by two VCR's.

**Description:** After the SEARCH AND PREROLL command is executed, this command is sent to the player VCR. The player VCR will lock the playback signal to the sync signal input to the SYNC IN connector.
When synchronization is completed, the VCR returns the COMPLETION code to the computer.

**Sample:** When EDIT PB STANDBY is sent to player VCR

```
        EXP-8   CMD
TxD  ──〈DFH〉──〈96H〉──────────────────────

                            CP
RxD  ─────────〈0AH〉──〈0AH〉─⌇─〈01H〉──────
```

**Note**

This command is executed only when it is sent after the SEARCH AND PREROLL command has been executed.
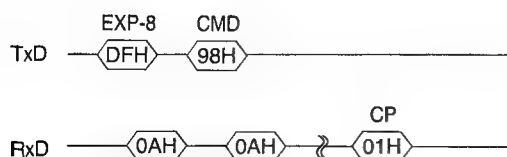
## EDIT PLAY (98H, EXP-8)

**Function:** Used for editing by two VCRs.

**Description:** After the EDIT PB STANDBY command is executed, this command is sent to the player VCR to start editing operations.
When the OUT point set is passed, the VCR returns the COMPLETION (01H) code to the computer.

**Sample:** When EDIT PLAY is sent to the player VCR

```
        EXP-8   CMD
TxD  ──〈DFH〉──〈98H〉──────────────────────

                            CP
RxD  ─────────〈0AH〉──〈0AH〉─⌇─〈01H〉──────
```

**Notes**

- This command is executed only when it is sent after the EDIT PB STANDBY command has been executed.
- When the VCR receives the EDIT PLAY command, it immediately executes the command.
Therefore, when you use two VCRs for editing, make sure that the timing of sending the command is right.

## Notes for Edit Operation Commands

- The tape is automatically advanced one frame if STILL mode continues for 5 minutes or longer for SEARCH AND PREROLL or EDIT PB STANDBY. When editing with EDIT PB, execute the EDIT PB command within 5 minutes from the time that the VCR entered standby mode.
- When SEARCH WITH DATA or SEARCH AND PREROLL is executed for sections where timecode cannot be read, the tape is advanced at 14 times (DSR-20) or 17 times (DSR-20P) for about 3 seconds. If no timecode can be read after advancing the tape for 3 seconds, NOT TARGET is returned.
- The first 5 frames after an unrecorded section cannot be searched.
Specify a point at least 5 frames from unrecorded sections as the search point timecode for the SEARCH WITH DATA and SEARCH AND PREROLL commands.
However, for the SEARCH AND PREROLL command, an additional 3 seconds from unrecorded sections is required as the preroll portion (total 3 seconds + 5 frames).
- If the REMOTE/LOCAL switch on the front panel of the VCR is set to LOCAL during a SEARCH WITH DATA or SEARCH AND PREROLL operation, the search is not resumed correctly after returning the switch to REMOTE.
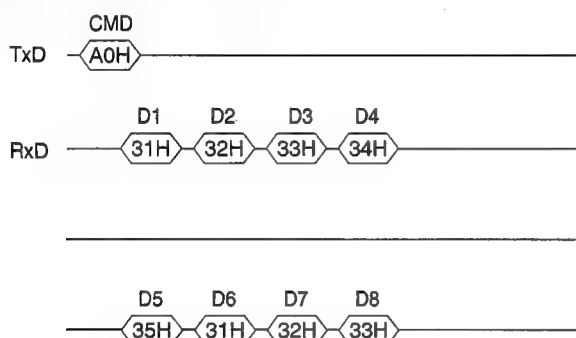
# 2-4 Time Data Manipulation Commands

The time data manipulation commands manipulate time code values. Time code values are expressed as numerical "commands" 0 to 9.

## TIME CODE SENSE (A0H)

**Function:** Requests the VCR to return timecode data.

**Sample:** For the 8mm timecode 12H 34M 51S 23F



### Notes

- If no timecode is recorded, the VCR returns all 0s.
- If timecode cannot be read, the VCR holds and returns the most recently read timecode.
- To determine whether timecode was read or not, check the TIME CODE DETECT bit shown in "2-6-1 Status 2 Data Table".

## TIMER MODE SENSE (C1H, EXP-7)

**Function:** Checks the TIME CODE and the DF flag (DF/NDF).

| Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|------|------|------|------|------|------|------|------|
| 1 | 0 | 0 | 0 | 0 | READER 0:NDF 1:DF | GENE- RATOR 0:NDF 1:DF | TIMER MODE 0:TIME CODE 1:CTL |

**Sample:** When the TIME CODE GENERATOR is NDF, and the TIME CODE on the tape is DF.
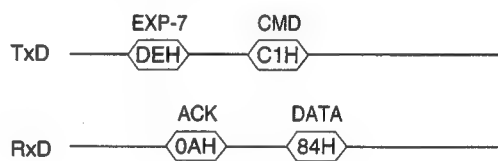


### Notes

- TIME CODE is the only TIMER MODE supported by this unit. Bit 0 is always set to 0.
- This command is valid only for the DSR-20. For the DSR-20P, the READER and GENERATOR bits are always set to NDF.

## 2-5-1 Status 1 Data Table

| BYTE NO. | BIT7 (MSB) | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 (LSB) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0 | REC INHIBIT | CASSETTE OUT | 0 | 0 | ERROR |
| 2 | VIDEO EE MODE | AUDIO EE MODE | 0 | 0 | SLACK | 0 | TAPE TOP | TAPE END |
| 3 | TIMER PLAY ON | TIMER REC ON | 0 | 0 | 0 | 0 | SEARCH MODE | 0 |
| 4 | PLAY | FF | REW | STOP | STANDBY LAMP | EJECT | REC | 0 |
| 5 | PAUSE | 0 | SHUTTLE FWD | SHUTTLE REV | SPEED CODE 3 | SPEED CODE 2 | SPEED CODE 1 | SPEED CODE 0 |

## 2-5-2 The First Byte

BIT7: 1
BIT6: 0
BIT5: 0
BIT4: REC INHIBIT
    1 = A tape on which recording is inhibited has been inserted.
BIT3: CASSETTE OUT
    1 = No cassette tape is inserted in the VCR.
BIT2: 0
BIT1: 0
BIT0: ERROR
    1 = An error occurred.
    Other commands are not accepted until this state is cleared by the C.E. or C.L. AND INITIALIZE command.

**Note**

The correct status is not returned for the following queries when the switch on the front panel of the VCR is set to LOCAL and when the VCR is not powered on.
TIME CODE SENSE (A0H)
STATUS INQ (67H)
STATUS SENSE 1 (D7H)
STATUS SENSE 2 (B0H)
STATUS SENSE 3 (B1H)
TIMER MODE SENSE (C1H, EXP-7)

However, the correct status is returned in bit 7 (TIMER PLAY ON) and bit 6 (TIMER REC ON) of byte 3 of Status 1, in bit 6 (POWER ON) and bit 3 (LOCAL) of byte 1 of Status 2, and in bit 6 (NTSC/PAL) of byte 1 of Status 3.

For timecode, the value read immediately before switching to local mode is returned.

## 2-5-3 The Second Byte

BIT7: VIDEO EE MODE
    1 = Video signals input to the VCR are being output.
BIT6: AUDIO EE MODE
    1 = Audio signals input to the VCR are being output.
BIT5: 0
BIT4: 0
BIT3: SLACK
    1 = The cassette tape does not operate normally.
    When the tape is slack, only the EJECT command is accepted. Unless the EJECT command is sent, further commands are not accepted.
BIT2: 0
BIT1: TAPE TOP
    1 = The beginning of the tape is detected.
BIT0: TAPE END
    1 = The end of the tape is detected.

# 2-5 Status 1 Data Bit Assignment

In an emergency state, the only valid commands are POWER OFF and EJECT.
To check for an emergency state, check bit 3 (SLACK) of byte 2 of Status 1, and bit 4 (TAPE TROUBLE) of byte 1 of Status 2.
When either of these bits is 1, you should send the clear command (C.L.) and then send the POWER OFF or EJECT command.
If the POWER OFF or EJECT command is not accepted, set the REMOTE/LOCAL switch on the front panel of the VCR to LOCAL and power off or eject on the VCR side. If this does not clear the emergency state, the cause may be a problem with the unit. Refer to "Self-diagnosis function" in Chapter 4 "Maintenance and Troubleshooting" of the Operating Instructions.

## 2-5-4 The Third Byte

BIT7: TIMER PLAY ON
BIT6: TIMER REC ON
BIT5: 0
BIT4: 0
BIT3: 0
BIT2: 0
BIT1: SEARCH MODE
    1 = Search operation is being carried out.
BIT0: 0

## 2-5-5 The Fourth Byte

BIT7: PLAY
    1 = Normal playback is being carried out.
BIT6: FF
    1 = The tape is being fast forwarded.
BIT5: REW
    1 = The tape is being rewound.
BIT4: STOP
    1 = The VCR is in STOP mode.
BIT3: 0
    1 = The cassette is being loaded or unloaded.
BIT2: EJECT
    1 = The cassette is being ejected.
BIT1: REC
    1 = Recording or recording is paused.
BIT0: 0

## 2-5-6 The Fifth Byte

BIT7: PAUSE
    1 = Tape transport is being paused.
BIT6: 0
BIT5: SHUTTLE FWD
    1 = Shuttle operation in the forward direction is being carried out.
BIT4: SHUTTLE REV
    1 = Shuttle operation in the reverse direction is being carried out.
BIT3: Speed code 3
BIT2: Speed code 2
BIT1: Speed code 1
BIT0: Speed code 0

| BIT Item | 3 | 2 | 1 | 0 | FWD | REV | Information |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | STILL | STILL | |
| 2 | 0 | 0 | 0 | 1 | +×1/30 | −×1/30 | |
| 3 | 0 | 0 | 1 | 0 | +×1/10 | −×1/10 | |
| 4 | 0 | 0 | 1 | 1 | +×1/5 | −×1/5 | |
| 5 | 0 | 1 | 0 | 0 | — | — | Not output by this unit. |
| 6 | 0 | 1 | 0 | 1 | +×1 | −×1 | |
| 7 | 0 | 1 | 1 | 0 | +×2 | −×2 | |
| 8 | 0 | 1 | 1 | 1 | +×9 | −×9 | DSR-20 |
| 8 | 0 | 1 | 1 | 1 | +×11 | −×11 | DSR-20P |
| 9 | 1 | 0 | 0 | 0 | +×14 | −×14 | DSR-20 |
| 9 | 1 | 0 | 0 | 0 | +×17 | −×17 | DSR-20P |

## 2-6-1 Status 2 Data Table

| BYTE NO. | BIT7 (MSB) | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 (LSB) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | POWER ON | 0 | TAPE TROUBLE | LOCAL | 0 | TIME CODE DETECT | 0 |
| 2 | 0 | 0 | 0 | IN-ENTRY | OUT-ENTRY | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | IN-OUT STATUS | 0 | EDIT PB | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | MECHANICAL TRANSITION | SERVO LOCK | SEARCH AND PREROLL | EDIT PB STANDBY | 0 | STANDBY COMPLETION |

## 2-6-2 The First Byte

BIT7: 1
BIT6: POWER ON
   1 = Power is on.
BIT5: 0
BIT4: TAPE TROUBLE
   1 = The tape has stuck to the drum or other similar troubles have occurred.
   In an emergency state, the only valid commands are POWER OFF and EJECT.
   To check for an emergency state, check bit 3 (SLACK) of byte 2 of Status 1, and bit 4 (TAPE TROUBLE) of byte 1 of Status 2. When either of these bits are 1, you should send the clear command (C.L.) and then send the POWER OFF or EJECT command.
   If the POWER OFF or EJECT command is not accepted, set the switch on the front panel of the VCR to LOCAL and power off or eject on the VCR side. If this does not clear the emergency state, the cause may be a problem with the unit. Refer to "Self-diagnosis function" in Chapter 4 "Maintenance and Troubleshooting" of the Operating Instructions.
BIT3: LOCAL
   1 = LOCAL control mode is selected with the REMOTE/LOCAL switch
BIT2: 0
BIT1: TIME CODE DETECT
   1 = Time code has been read.
BIT0: 0

## 2-6-3 The Second Byte

BIT7: 0
BIT6: 0
BIT5: 0
BIT4: IN-ENTRY
   1 = Time code of the IN point is stored in memory.
BIT3: OUT-ENTRY
   1 = Time code of the OUT point is stored in memory.
BIT2: 0
BIT1: 0
BIT0: 0

## 2-6-4 The Third Byte

BIT7: 0
BIT6: 0
BIT5: 0
BIT4: IN-OUT STATUS EDIT PLAY
   1 = Mode and the tape is running between the IN and OUT points.
BIT3: 0
BIT2: EDIT PB
   1 = Playback for the purpose of edit is being carried out.
BIT1: 0
BIT0: 0

## 2-6-5 The Fourth Byte

BIT7: 0
BIT6: 0
BIT5: 0
BIT4: 0
BIT3: 0
BIT2: 0
BIT1: 0
BIT0: 0

## 2-6-6 The Fifth Byte

BIT7: 0
BIT6: 0
BIT5: MECHANICAL TRANSITION
   1 = The mechanical deck is changing modes.
BIT4: SERVO LOCK
   1 = The drum servo and capstan servo are locked.
BIT3: SEARCH AND PREROLL
   1 = SEARCH AND PREROLL command is being executed.
BIT2: EDIT PB STANDBY
   1 = EDIT PB STANDBY command is being executed.
BIT1: 0
BIT0: STANDBY COMPLETION
   1 = Execution of EDIT PB STANDBY command has been completed.

**Notes**

• The correct status is not returned for the following queries when the switch on the front panel of the VCR is set to LOCAL and when the VCR is not powered on.
TIME CODE SENSE (A0H)
STATUS INQ (67H)
STATUS SENSE 1 (D7H)
STATUS SENSE 2 (B0H)
STATUS SENSE 3 (B1H)
TIMER MODE SENSE (C1H, EXP-7)

However, the correct status is returned in bit 7 (TIMER PLAY ON) and bit 6 (TIMER REC ON) of byte 3 of Status 1, in bit 6 (POWER ON) and bit 3 (LOCAL) of byte 1 of Status 2, and in bit 6 (NTSC/PAL) of byte 1 of Status 3.

For timecode, the value read immediately before switching to local mode is returned.

• When the INPUT SELECT or INDEX ON/OFF commands are sent, bit 5 (MECHANICAL TRANSITION) of byte 5 of Status 2 may be on.

### 2-7-1 Status 3 Data Table

| BYTE NO. | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | NTSC/PAL | MP/ME | 0 | INDEX ON | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | PB TAPE FORMAT | DV PB SP/LP | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | REC TAPE FORMAT | DV REC SP/LP | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | VIDEO INPUT SELECT CODE 1 | VIDEO INPUT SELECT CODE 0 | 0 | 0 |

### 2-7-2 The First Byte

BIT7: 1
BIT6: NTSC/PAL
    1 = The VCR is a PAL VCR.
    For the DSR-20, this bit is cleared to 0.
    For the DSR-20P, this bit is set to 1.
BIT5: MP/ME
    1 = An ME type video cassette was detected.
    0 = An MP type video cassette was detected.
BIT4: 0
BIT3: INDEX ON
    1 = Timecode is superimposed on the monitor.
BIT2: 0
BIT1: 0
BIT0: 0

### 2-7-3 The Second Byte

BIT7: 0
BIT6: 0
BIT5: 0
BIT4: 0
BIT3: 0
BIT2: 0
BIT1: 0
BIT0: 0

### 2-7-4 The Third Byte

BIT7: 0
BIT6: 0
BIT5: PB TAPE FORMAT
    1 = DVCAM
    0 = DV
BIT4: DV PB SP/LP
    1 = SP mode
    Significant only when BIT5=0.
    (This unit always returns 1 in this bit.)
BIT3: 0
BIT2: 0
BIT1: 0
BIT0: 0

**Note**

This unit cannot play back LP tapes in the DV format.

### 2-7-5 The Fourth Byte

BIT7: 0
BIT6: 0
BIT5: REC TAPE FORMAT
    1 = DVCAM (This unit always returns 1)
    0 = DV
BIT4: DV REC SP/LP
    1 = SP mode
    Significant only when BIT5 = 0.
    (This unit always returns 1 in this bit.)
BIT3: 0
BIT2: 0
BIT1: 0
BIT0: 0

**Note**

This unit can record only the DVCAM format.

### 2-7-6 The Fifth Byte

BIT7: 0
BIT6: 0
BIT3, 2: VIDEO INPUT SELECT CODE 1, CODE
    0

| CODE1 | CODE0 | Setting |
|-------|-------|---------|
| 0 | 0 | Unused |
| 0 | 1 | S-VIDEO |
| 1 | 0 | VIDEO |
| 1 | 1 | DV |

**Note**

• The correct status is not returned for the following
queries when the switch on the front panel of the
VCR is set to LOCAL and when the VCR is not
powered on.
TIME CODE SENSE (A0H)
STATUS INQ (67H)
STATUS SENSE 1 (D7H)
STATUS SENSE 2 (B0H)
STATUS SENSE 3 (B1H)
TIMER MODE SENSE (C1H, EXP-7)

However, the correct status is returned in bit 7
(TIMER PLAY ON) and bit 6 (TIMER REC ON) of
byte 3 of Status 1, in bit 6 (POWER ON) and bit 3
(LOCAL) of byte 1 of Status 2, and in bit 6 (NTSC/
PAL) of byte 1 of Status 3.

For timecode, the value read immediately before
switching to local mode is returned.

# 2-8 Status INQ Data Bit Assignment

## 2-8-1 Status INQ Data Table

| BYTE NO. | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | SEARCH | 0 | 0 | CASSETTE OUT | 0 | 0 | ERROR |
| 2 | 0 | 0 | 0 | REC BUSY | 0 | REC STANDBY | 0 | 0 |
| 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | SEARCH MODE | NUMERICAL INPUT |
| 5 | PLAY DIRECTION | STOP | STILL PLAY | SCAN | STEP | SLOW | FAST PLAY | NORMAL PLAY |

## 2-8-2 The First Byte

BIT7: 1
BIT6: SEARCH
    1 = SEARCH flag
BIT5: 0
BIT4: 0
BIT3: CASSETTE OUT flag
    1 = The VCR is carrying out a search or repeat
    operation.
BIT2: 0
BIT1: 0
BIT0: ERROR
    1 = Various error conditions.

## 2-8-3 The Second Byte

BIT7: 0
BIT6: 0
BIT5: 0
BIT4: REC BUSY flag
    1 = The VCR is currently recording.
BIT3: 0
BIT2: REC STANDBY flag
    1 = The VCR is in REC STANDBY
BIT1: 0
BIT0: 0

## 2-8-4 The Third Byte

BIT7: 0
BIT6: 0
BIT5: 0
BIT4: 0
BIT3: 0
BIT2: 0
BIT1: 0
BIT0: 0

## 2-8-5 The Fourth Byte

BIT7: 0
BIT6: 0
BIT5: 0
BIT4: 0
BIT3: 0
BIT2: 0
BIT1: SEARCH MODE flag
    1 = A REPEAT WITH DATA command has
    been received. This setting is maintained
    during repeat data input. At the start of
    playback, the flag is set to "0". See 1st byte,
    bit D6.
BIT0: NUMERICAL INPUT
    1 = The VCR is waiting for numeric input
    accompanying various commands.

### 2-8-6  The Fifth Byte

BIT7:  PLAY direction
      1 = Reverse play
      0 = Forward play
BIT6:  1 = STOP
BIT5:  1 = STILL PLAY or PLAY PAUSE
BIT4:  1 = SCAN
      DSR-20: ($-\times14$, $-\times9$, $+\times9$, $+\times14$)
      DSR-20P: ($-\times17$, $-\times11$, $+\times11$, $+\times17$)
BIT3:  1 = STEP ($-\times1/30$, $+\times1/30$)
BIT2:  1 = SLOW ($-\times1/5$, $-\times1/10$, $+\times1/10$, $+\times1/5$)
BIT1:  1 = FAST PLAY ($-\times2$, $+\times2$)
BIT0:  1 = NORMAL PLAY (PB, $\times1$, $-1$)

# Index